

Equipping Students with a Transferable Skill: A Fool-proof Guide for Introducing Immunohistochemistry to the Undergraduate Neuroscience Laboratory

Audrey Chen

University of California - Irvine, Neurobiology and Behavior, 1221 McGaugh Hall, Irvine CA
92697 USA
(Lewac@uci.edu)

Widely used in research laboratories, immunohistochemistry is a transferable skill that prepares undergraduate students for a variety of careers in the biomedical field; however, it is rarely introduced to students in the classroom laboratory. We have developed an effective, inquiry-based immunohistochemistry laboratory exercise which introduces students to the theory, procedure, and data interpretation of antibody staining in brain tissue. In two 4-hr lab sessions, students are exposed to handling of delicate brain slices, fluorescent microscopy, and data analysis using the Allen Brain Atlas, an online freely accessible database of expression patterns in the brain. The workshop will outline the standard lab lesson and also introduce adapted lessons to accommodate shorter class times, bypass the need for live vertebrates, or integrate into a 4-week course-based research experience. Workshop participants will visualize more difficult parts of the procedure, gain logistical tips on successful lab sessions, and leave with handouts of the protocol, supply list, and in-class worksheet. Although originally designed for upper-division neuroscience lab classes, this laboratory exercise would also be suitable for upper-division cell biology labs.

Keywords: immunohistochemistry, brain tissue, fluorescent microscopy

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